No. 646,847. Patented Apr. 3, 1900.

P. LINDEMEYR.

TOOL FOR FORMING NECKS OF BOTTLES.

(Application filed June 15, 1898.)

(No Model.) 2 Sheets—Sheet 1.

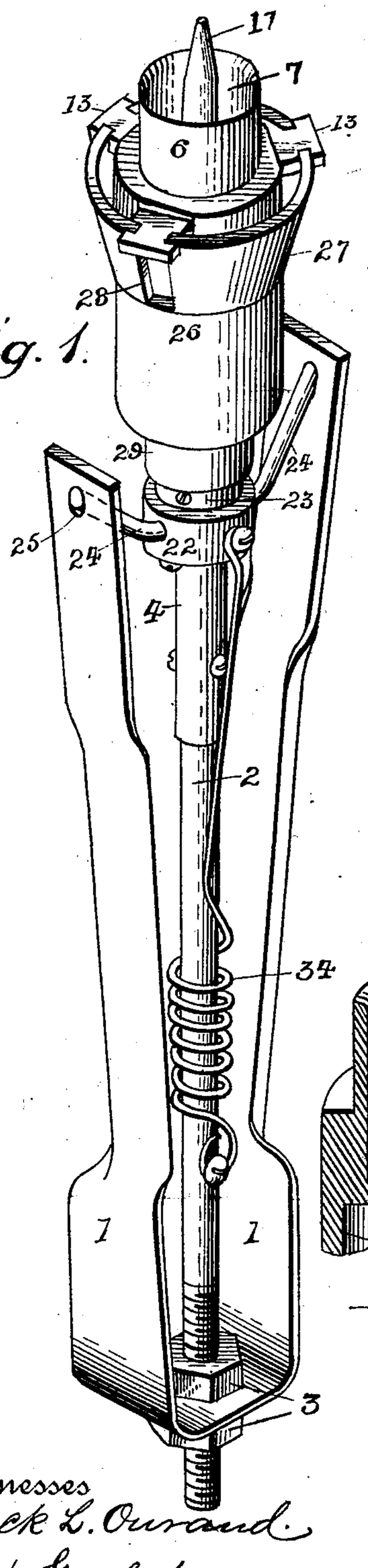

Fig. 1.

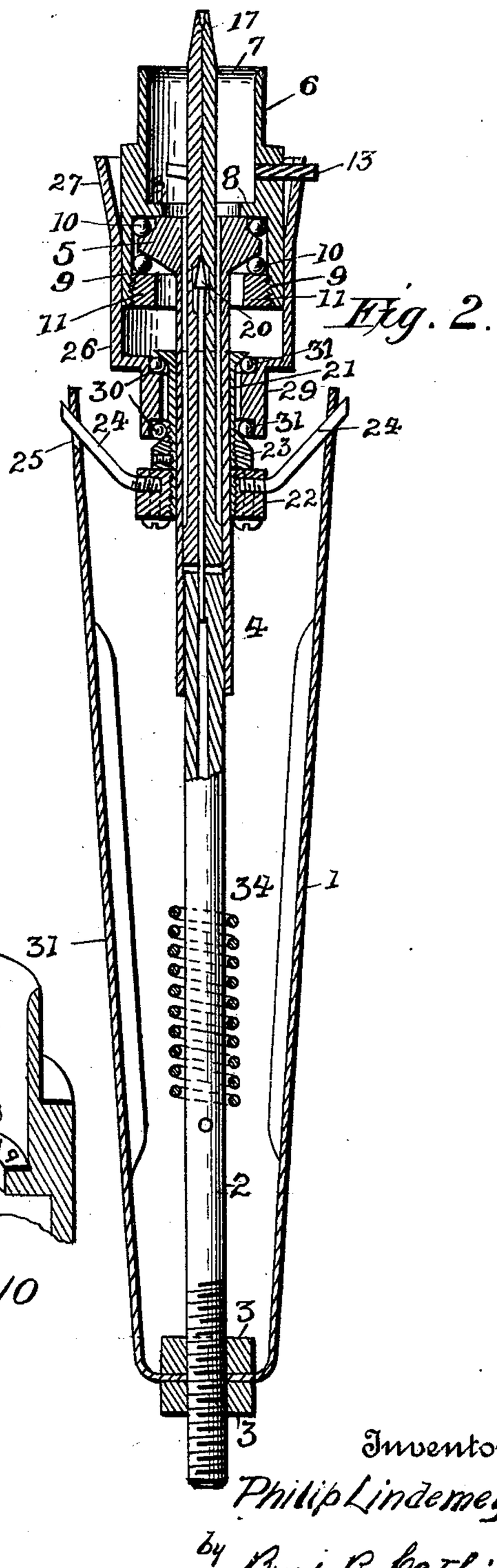

Fig. 2.

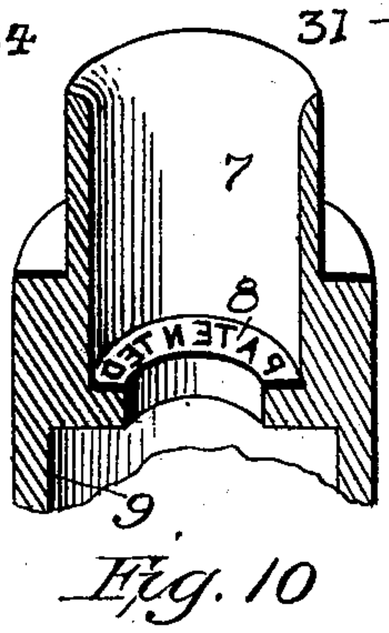

Fig. 10

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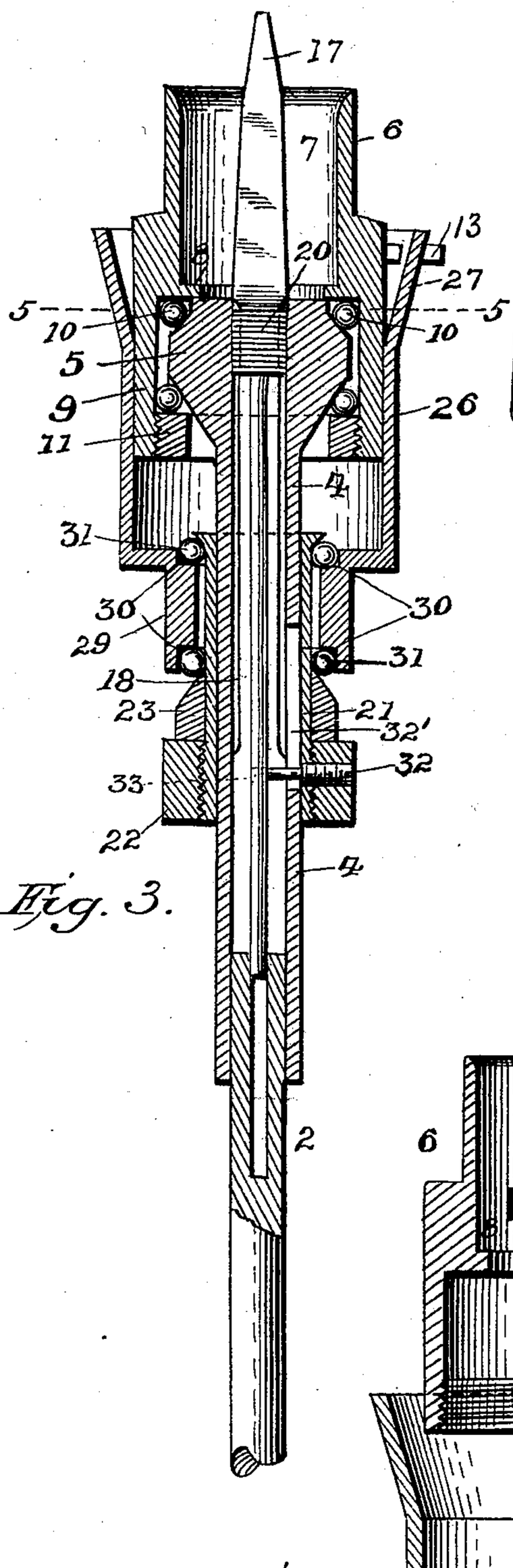

Fig. 3.

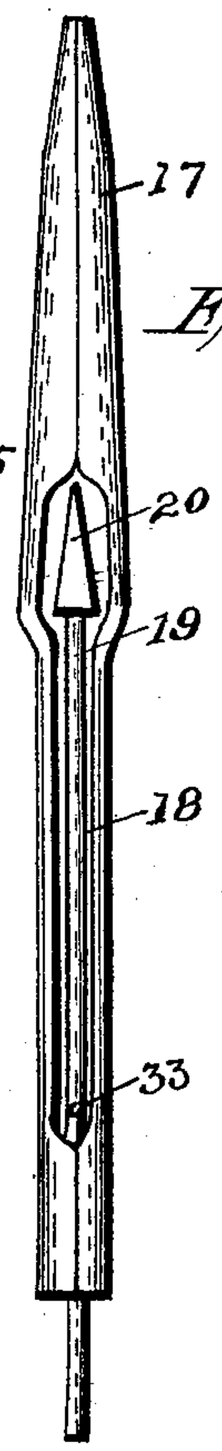

Fig. 4.

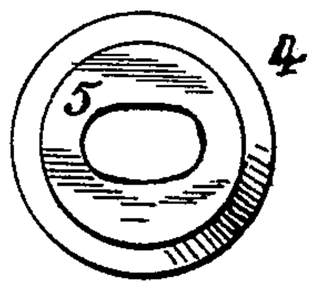

Fig. 6.

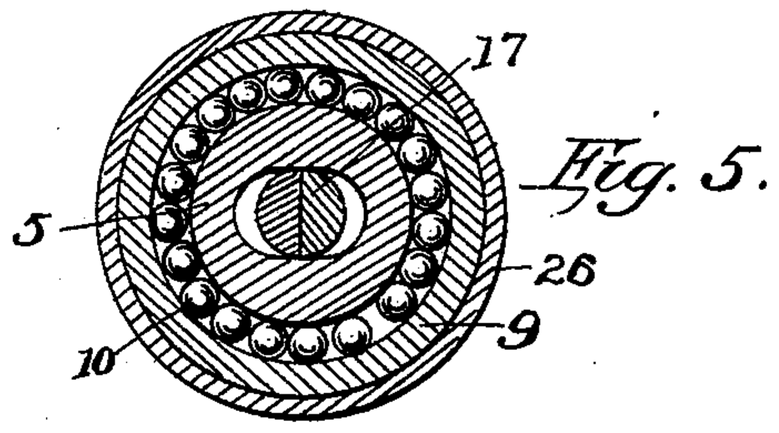

Fig. 5.

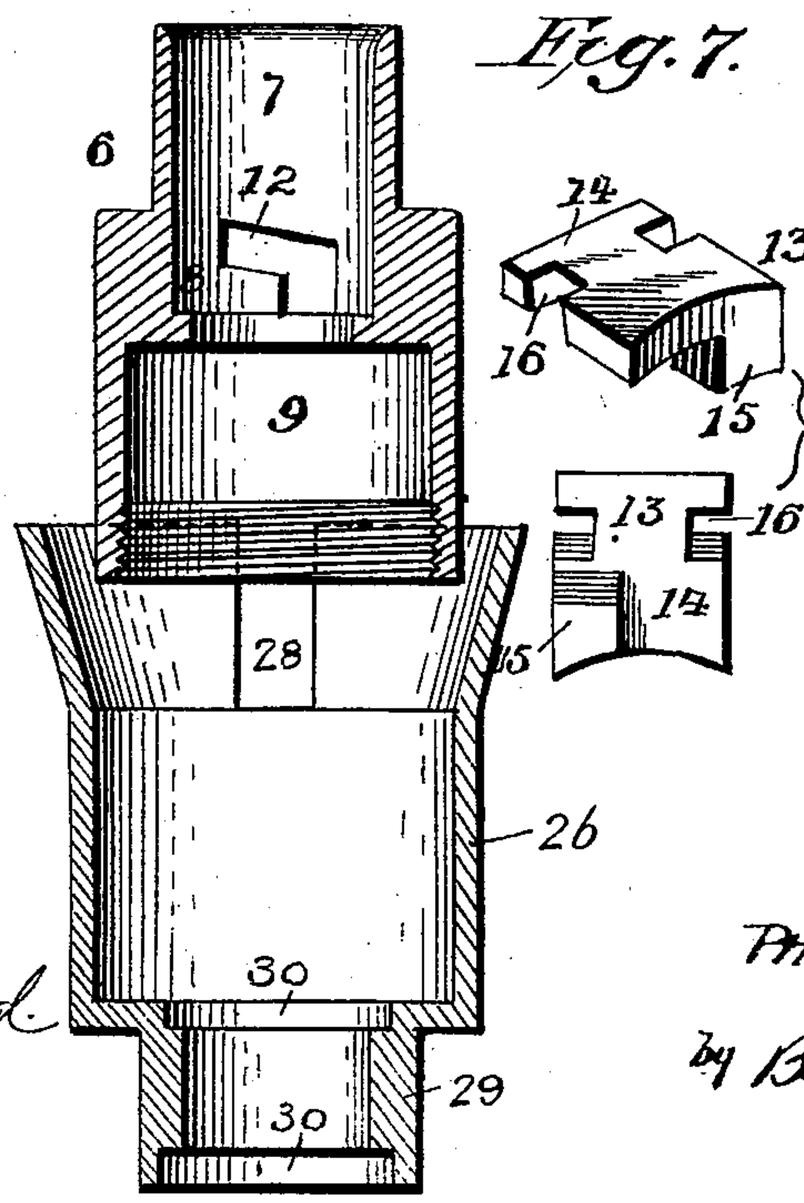

Fig. 7.

Fig. 8.

Fig. 9

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UNITED STATES PATENT OFFICE.

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TOOL FOR FORMING NECKS OF BOTTLES.

SPECIFICATION forming part of Letters Patent No. 646,847, dated April 3, 1900.

Application filed June 15, 1898. Serial No. 683,528. (No model.)

To all whom it may concern:

Be it known that I, PHILIP LINDEMEYR, a resident of Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Tools for Forming Necks of Bottles and Like Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to tools for forming bottle-necks and the like; and it has for its object to increase the capacities and efficiency of such tools.

In the accompanying drawings, Figure 1 is a perspective view of the tool. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is an enlarged vertical section of the same, the bow being omitted. Fig. 4 is a view in elevation of the bottle-throat former, the expander therefor being shown in position. Fig. 5 is a horizontal section on the line 5 5 of Fig. 3. Fig. 6 is a plan of the casing for the throat-former. Fig. 7 is a vertical longitudinal section of the mold-body. Fig. 8 represents a perspective and a bottom plan of the movable mold-section used to form the slot in the bottle-neck. Fig. 9 is a longitudinal section of a mold-inclosing case. Fig. 10 is a partial perspective of a detail.

Referring to the drawings, 1 denotes a spring-bow adjustably held upon a rod 2 by nuts 3.

4 denotes what I term a "casing" for the bottle-throat former, it being a cylindrical body secured to the upper end of rod 2 by screws and enlarged at its upper end, as at 5, for a purpose hereinafter described.

6 represents the mold-body, comprising a mold 7 for the neck, having at its lower end an inwardly-projecting annular rib or flange 8 and a rearward tubular extension 9. The mold-body 6 mediately rests upon the beveled end of the enlargement 5, which is so shaped as to receive balls 10 between it and the tubular extension 9 of the mold, a ball-retaining ring 11 preventing the displacement of the balls.

The tube 4, which in the present instance carries the lip-former, is mediately the mold-support, being itself supported by the rod 2, fixed to the bow.

In the wall of the body-mold 6 are formed a plurality of openings 12, each adapted to receive a movable mold-section 13 of such shape as to form a slot of the desired configuration in the bottle-neck. In the present instance I have illustrated the use of but three of the mold-sections, each comprising a flat body 14, having at one edge a downwardly-projecting lug 15, the edges of the outer portion of the body of the mold-section being formed with notches 16, all as clearly shown in Fig. 8.

Within the casing 4 is what I term a "bottle-throat former" 17, the upper end of which projects through and beyond the mold-body 6 and is of the proper shape for the use desired. This former is in two vertical sections, each cut out for a portion of its length, as at 18, to form a recess for a throat-former expander 19, having at its upper end a wedge-shaped spreader 20, adapted when the expander is moved upward to force the sections of the former apart, all as clearly shown in Fig. 4.

21 represents a sleeve loose on casing 4 and screw-threaded at its lower end to receive a collar 22, a cone-shaped ring 23 being secured to the sleeve above the collar.

24 represents fingers projecting laterally and upwardly from collar 22. Free ends of these fingers enter openings 25 in the ends of bow 1, as shown in Figs. 1 and 2.

26 represents the case of a size to encircle the mold, the upper end of the case flaring outwardly, as at 27. This flaring portion is formed with slots 28, situated to embrace the mold-sections 13, the edges of the slots entering the notches 16 in the mold-sections, as clearly shown in Fig. 1. By this construction reciprocation of the case will move the mold-sections inward and outward, as will be evident. The lower end of the case is reduced in size at 29 to loosely fit sleeve 21, and annular depressions 30 are formed in the upper and lower edges of the reduced portion 29 to receive balls 31, the upper set of which is retained by an incline on the upper edge of sleeve 21, the lower set being retained

by the cone-shaped ring 23, as clearly shown in Figs. 2 and 3.

32 is a pin screwed into collar 22 and passing through a slot 32′ in casing 4, its end entering a hole 33 in the expander 19, as shown in Fig. 3, and thereby moving the expander in the operation of the tool.

34 is a coiled spring encircling rod 2, its lower end being secured to said rod and its upper end secured to collar 22, as shown in Fig. 1.

In operation, the parts being assembled as above described, the bottle after it has been blown and its neck reheated is presented to the tool and pressed upon the former 17 and within the mold-body 6. The bow 1 is then compressed, with the effect to move forward the sleeve 21, the collar 22 and ring 23 being moved with the sleeve and also the case 26. The expander 19 is also moved forward, forcing the sections of the throat-former apart. The forward movement of case 26 will force inward the mold-sections 13, forming the desired slots in the bottle-neck. In order to effectively handle the bottle and prevent loss of its shape, it must be rotated during this molding operation, and to maintain an exact relative position between the bottle and mold-body I have mounted the latter, and also the case, upon suitable antifriction-bearings above described, permitting the easy circumferential reciprocation of the parts. The throat-former, as is evident, remains stationary, forming the revolving bottle-neck into the proper shape. The enlargement 5, which constitutes the mold-bottom, also remains stationary with relation to the rotating mold-body 6, with the effect to form and smooth the bottle-lip. These operations are effected immediately after the bottle-neck has been pushed to the fixed mold-bottom 5 and forced upon the rib 8, which forms an offset in the neck adjacent the lip of the bottle, finishing the molding of the neck and lip. As soon as the bow is released the mold-sections, the case, and the throat-expander are automatically retracted by spring 34, thus returning the parts to their normal positions, leaving the interior of the mold-body 6 smooth and unbroken, permitting the withdrawal of the finished article.

The invention is applicable to the forming of the necks or tops of various vessels. It is also applicable to forming transverse slots, depressions, grooves, or threads of various forms.

Since the mold-body and bottle are rotated together, letters can be formed in different parts of the neck by suitable type situated in the mold-body. In Fig. 10 are indicated mold-type for forming letters on a shoulder of the neck by means of the shoulder-forming flange or part 8.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a rotatable mold-body, a fixed bottom therefor, the mold-body being formed with a tubular extension projecting below the fixed bottom, and antifriction devices between the bottom and tubular extension, substantially as described.

2. The combination of a rotatable mold-body, a throat-former made in two independent sections, a tubular casing for the throat-former and comprising the sole support for its sections, and a fixed bottom for the mold-body formed by enlarging the end of the throat-former casing.

3. The combination of a rotatable mold-body, a throat-former made in two independent sections, a tubular casing for the throat-former and comprising the sole support for its sections, and a fixed bottom for the mold-body formed by enlarging the end of the throat-former casing, said mold-body being provided with an interior rib immediately above the bottom.

4. A rotatable mold-body, a throat-former made in sections projecting into the mold-body, and a casing for the throat-former, said casing being interiorly formed at its lower end to bind the sections together and support them and at the upper end to permit a spreading movement of the sections.

5. In a tool for forming the necks of bottles and the like, a rotatable mold-body, a bottom permanently fixed with relation to the tool, an annular rib formed on the mold-body, mold-sections carried by the mold-body, and means for operating said mold-sections, substantially as described.

6. In a tool for forming the necks of bottles and the like, a former for the throat of the bottle made in two independent sections, means for spreading said sections apart throughout their operative portions, and a tubular casing for the former, the interior of said casing being cylindrical at the lower end to bind the sections of the former together and of oval shape at the top to permit the spreading of the sections.

7. In a tool for forming the necks of bottles and the like, a rotatable mold-body, mold-sections transversely movable in said body, the outer edges of the sections being formed with notches, a case flared outwardly at its upper end, and formed with slots having edges to engage the mold-sections, said edges entering the notches in the mold-sections, and means for reciprocating the case to operate the sections, substantially as described.

8. In combination, a rod, a casing secured to the upper end of the rod, a throat-former within the casing, a sleeve loose on the outer side of the casing, a mold-body rotatively mounted on the upper end of the former-casing, mold-sections transversely movable in the mold-body, a case for operating said sections, said case being rotatively mounted on the sleeve, a spring-bow adjustably secured on the rod, and fingers projecting lat-

erally from the sleeve and entering openings in the bow members, substantially as described.

9. In combination, a rod, a casing secured to the upper end of the rod, a throat-former within the casing, an expander within the throat-former, a mold-body rotatively mounted on the upper end of the former-casing, mold-sections transversely movable in the mold-body, a case for operating said sections, a sleeve loose on the outer side of the former-casing, the case being rotatively mounted on the sleeve, a pin passed through the sleeve and connected with the throat-expander, and means for reciprocating the case and sleeve, whereby the mold-sections are operated and the expander is forced upward into the throat-former, substantially as described.

10. In combination, a rotatable mold-body, mold-sections transversely movable in said body, and means for operating said sections, the mold-body being thickened at that portion through which the mold-sections operate, whereby a substantial bearing-surface for said sections is obtained.

11. In a tool for forming the necks of bottles and the like, a rotatable mold-body, said mold-body being formed with a tubular extension projecting below the mold, and antifriction devices between the tubular extension and a support for the mold.

12. In a tool for forming the necks of bottles and the like, a rotatable mold-body provided with mold-sections, said mold-body being formed with a tubular extension projecting below the mold, a support for the mold, and antifriction devices between the tubular extension and mold-support, an endwise-movable case to move the mold-sections, and antifriction-balls between the case and the support for the mold.

13. In a tool for forming the necks of bottles, a body-mold, a bow, a throat-former projecting into the mold, a casing for the throat-former, an expander for the throat-former, a pin projecting from the expander and passing through the casing, and means intermediate the bow and pin whereby the operation of the bow reciprocates the expander.

14. In a tool for forming the necks of bottles, a rotatable mold for forming the outside of the neck in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into a mold, a mold-support, said mold having an extension, and antifriction devices intermediate the extension and the mold-support.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

PHILIP LINDEMEYR.

Witnesses:

FRANK D. BLACKISTONE,

DAVID W. GOULD.